

ZHUKHOVITSKIY, A.

"Gas.chromatography in 1961." Reviewed by A.Zhukhovitskiy.  
Zhur.anal.khim. 18 no.7:908-909 J1 '63. (MIRA 16:11)

1ST AND 2ND PAGES PROCESSED AND PROPERTIES INDEX

Structural formulas and the theory of spin valence.  
A. A. Zhukhovitskiĭ. J. Phys. Chem. (U. S. S. R.) 4,  
663-7 (1950)

ASH-31A METALLURGICAL LITERATURE CLASSIFICATION

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*2*

Theory of the adsorption of a mixture of vapors. A. A. Zhukovitskiĭ. J. Phys. Chem. (U. S. S. R.) 10, 412-17 (1937). Theoretical. Proceeding from the Polanyi and the capillary-condensation theories of adsorption, Zh. derives equations for adsorption from vapor mixts. and from solids.  
P. H. Rathmann

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCEDURES AND PROPERTIES INDEX									
<p>1A</p> <p>Theory of adsorption from solutions. R. Zhukhovitskiy. <i>Acta Physicochim. U. R. S. S. R.</i> 63:1-48 (1959).            Theory based on adsorption potentials is developed. Qualitatively the predictions of the theory agree with exptl. data; quant. applications yield disagreements which are tentatively explained. B. C. P. A.</p>									
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>									
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1ST AND 2ND CODES										3RD AND 4TH CODES									
PROCESSES AND PROPERTIES INDEX																			
<p>CA</p> <p>2</p> <p>Dynamics of the sorption process. A. A. Zhekhovitskii, Ya. L. Zhezhinskii and D. S. Gornitskii. <i>J. Phys. Chem. (U. S. S. R.)</i> 13, 202-10(1939).—The theory of Mecklenberg (<i>C. A.</i> 20, 811) is criticized as erroneous and misleading. — F. H. Rathmann</p>																			
ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION																			
1ST AND 2ND CODES										3RD AND 4TH CODES									
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TITLE AND TOP SUBJECT		PROCESSING AND PROPERTIES INDEX		3RD AND 4TH SECTIONS													
1A		2.2															
<p>Removal of gases from mud fluids. <i>Vu. Zhukhovichskii. Akad. Nauk. 1940.</i> The use of fairly stable foam is obtained after the primary chem. treatment of mud fluids with the usual emulsifiers (tannate, alk. soln. of sulfite-cellulose ext.). The use of acidol-soap naphtha (which is obtained from the decempr. reaction of the benzene alk. wastes with <math>\text{SO}_2</math>) decreased the <math>\eta</math> of mud fluid, increased its sp. gr. and destroyed foam almost completely. The naphthene acids contd. in acidol-soap naphtha destroy the foam and gas films. Addn. of barite soln. with a simultaneous addn. of acidol-soap naphtha stopped the boiling of mud fluids after several hrs. The main mass of gas in mud fluids is in the form of very small bubbles which remain in suspension, in spite of the difference of their sp. gr. The amt. of gas in such fluids reaches 20 vol. %, the sp. gr. decreases from 1.80 to 1.65 and the <math>\eta</math> increases from 32 to 60 sec. in a 6 mm. SPV tube. Addn. of 1 mol. of acidol-soap naphtha to 154 cu. m. of such solns. destroyed the bubbles on the 4th day, increased the sp. gr. to 1.80 (without addn. of barite) decreased the <math>\eta</math> to 32-5 and decreased the content of gas to 2%. The expenditure of acidol-soap naphtha is approx. 0.65% of the vol. of the mud fluid. It is added at a rate of 100-150 l./hr. and produces a smooth oily soln.</p> <p style="text-align: right;">W. R. Hearn</p>																	
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1ST AND 2ND CODES		PROCESSES AND PROPERTIES INDEX	3RD AND 4TH CODES
<p>Gas sampler for clay solutions (drilling mud). <u>Yu. Zhukhovitskii</u>. <u>Azerbaidzhan'skoe Neftyanoe Khoz.</u> 1940 No. 7, 38-9. — Construction details of a gas sampler used to draw gas from drilling mud coming from the well.</p> <p>A. A. Bochtinsk</p>		<p>22</p>	
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
FROM SYNONYM		FROM BOMBY	FROM BOMBY
FROM SYNONYM		FROM BOMBY	FROM BOMBY

REF. AND PMS. NUMBER										AUTHOR'S NAME										TITLE AND TOPIC									
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<p>Present status of the theory of valence. A. A. Zhukovitskiĭ, Ya. K. Syrkin and M. B. Dyatkina. <i>Vopr. Khim.</i>: 9, 930-47(1940).—The authors discuss valency from the phys. viewpoint of Schrödinger wave mechanics (<i>Collected Papers of Wave Mechanics</i>, C. A. 23, 4140).</p> <p style="text-align: right;">V. H. Rathmann</p>																													
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																													
SOURCE NO.										SUBJECT NO.										SERIALS NO.									
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ca 10

Valence state and additivity scheme in organic chemistry. Ya. K. Syrkin, A. A. Zhukhovitskii and M. R. Dynkina. *Uspekhi Khim.* 6, 1143-77 (1940). Quantum mechanics review for use of instructors. P. H. R.

ASACSLA METALLURGICAL LITERATURE CLASSIFICATION

GROUP 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



Surface tension of solutions. A. A. Zhukovskii.  
J. Phys. Chem. (U.S.S.R.) 18, 214-23 (1944); cf. C.A.  
39, 2448<sup>1</sup>.--Theoretical-math. The relations between  
the surface tension of binary solus. and the concn. and  
surface tension of the individual components are discussed.  
Exptl. data on  $C_2H_5-Et_2O$ , on  $C_2H_5-PhNO_2$ , and on aq.  
solus. of Me, Et, Pr, and Bu alcs., and Me, Et, and Pr  
acetates are compared with the results of theoretical calns.  
36 references.  
P. H. Rathmann

CA		PROCESSING AND PROPERTIES INDEX		2	
<p>Occlusion of gas from an air current by a bed of grains.            I. A. A. Zhukhovitskiy, Ya. L. Zabezhinskiy, and A. N. Tikhonov (Kishin' Inst., Moscow). <i>J. Phys. Chem. (U.S.S.R.)</i> 19, 253-61 (1945).--The rate <math>s</math> of adsorption by a powder of a gas much dil. with air is detd. by the diffusion of gas toward the grains. The diffusion within the grains takes place in the adsorption layer and is rapid. The rate <math>s</math> is proportional to <math>s - y</math>, <math>c</math> being the av. gas concn. in the given layer of the adsorbent bed and <math>y</math> the concn. in equil. with the amt. adsorbed at a given moment.</p> <p>If the effect of the longitudinal division (i.e., from one to another layer) on <math>c</math> is neglected and <math>y</math> is calcd. according to Henry's law, an equation for <math>s</math> can be derived. If the service time of a bed is known for definite bed length, grain size, gas concn., and speed of air flow, this equation permits calcd. the service time for another set of conditions.            J. J. Bikerman</p>					
<p>ASH-LEA METALLURGICAL LITERATURE CLASSIFICATION</p>					
<p>FROM SYNOPTIC</p>					
<p>FROM SYNOPTIC</p>					

ZHUKHOVITSKIY, A. A.

"The Surface Tension of Solutions." Acta Phys., Vol. XIX. Nos. 2-3, 1944.

Karpov Inst. of Phys. Chem., Moscow.

L 24861-66 ENT(m)/EMP(v)/EMP(1)/I IJP(c) NW/DJ/GS/114  
 ACC NR: AT6008952 (A) SOURCE CODE: UR/0000/65/000/000/0123/0137

AUTHOR: Zhukov, V. V.

ORG: none

TITLE: Manufacture of bearings coated with a thin layer of polycaprolactam, and a study of their efficiency

SOURCE: Moscow. Institut mashinovedeniya. Plastmassy v podshipnikakh skol'zheniya; issledovaniya, opyt primeneniya (Plastics in friction bearings; research and experiment in application). Moscow, Izd-vo Nauka, 1965, 123-137

TOPIC TAGS: antifriction bearing, antifriction material, polyamide, temperature, static load test, adhesion, steel, cast iron, bronze, aluminum/ St. 45 steel, Br. AZh 9-4 bronze, SOh 32-52 cast iron, AL-8 aluminum, ZDM-10/91 breaking machine

ABSTRACT: Factors affecting the bonding strength of polyamide coatings to metals are discussed. The adhesion of a polyamide coating to steel, bronze, cast iron, and aluminum was studied. The cubic specimens with a bonding area of 4 cm<sup>2</sup> were tested for 24 hrs in a ZDM-10/91 breaking machine. The test results (see Fig. 1) showed that the adhesion of a polycaprolactam film is a function of the temperature of preheating of the parts during application. Parkerizing of the specimens

Card 1/2

L 24861-66

ACC NR: AT6008952

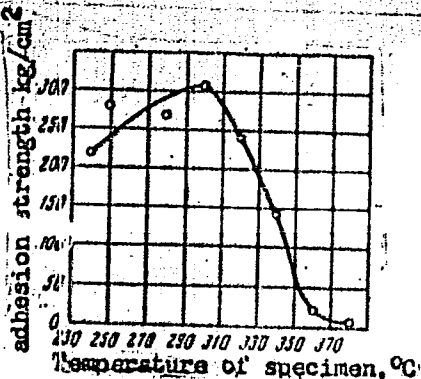


Fig. 1. Effect of temperature of preheating of parts on adhesion strength of polycaprolactam film to metal surface.

before application of the film considerably increases adhesion. The test results for bearings also show that wear is a function of duration of operation, rate of wear/of individual parts, and the nature of wear distribution over the friction surface. Thin polycaprolactam coatings can be successfully used for bearings with a load characteristic of  $p_v = 40 \text{ kg/cm}^2 \cdot \text{m/sec}$  even where tolerances are strict. Orig. art. has: 3 photographs, 3 graphs, 2 diagrams, and 3 tables.

SUB CODE: 11/

SUBM DATE: 31Jul65/ ORIG REF: 005

Card 2/2dda

ZHUKOVITSKIY, A. A.

"Surface Tension of Regular Solutions."

Acta Phys., Vol. XIX. No. 6, 1944. Karpov Inst. of Phys. Chem., Moscow.



**CA**

PROCESSES AND PROPERTIES UNDER  
STANDARD CONDITIONS

The theory of solution of high polymers. A. A. Zhukhovitskii (Karpov Inst. Phys. Chem., Moscow). *Accts. Physicochim.* (U.R.S.S.) 20, 897-904 (1948).—In view of the strong neg. deviations from Raoult's law for high-polymer solns., an attempt is made to eliminate the discrepancies between the theoretical and the exptl. values. The investigation is limited to comparatively dil. solns. It appears to be advisable to express the exptl. values of the partial entropy of mixing in terms of mod. characteristics. The derivation is made in terms of  $\Delta S_m(r)$ , which is the change in entropy of two mols. when brought from an infinite distance apart to a distance  $r$  apart, and  $\Delta S$ , which is the deviation of the entropy of the soln. from that of an ideal soln. The final equation is  $\Delta S_2 = (R/2)\pi^2$ , where  $\Delta S_2$  is the partial molar entropy of the second component,  $R$  is the gas const., and  $\pi = n_2/(n_1r + n_2)$ , in which  $\pi$  is the partial vol. fraction of the first component,  $n_1$  and  $n_2$  are the numbers of polymer and monomer molecules, resp., in the soln., and  $\pi$  is the number of polymer links. Exptl. values for solns. of rubber and gutta-percha in toluene give values only  $1/3$  of  $R/2$ . The reasons for deviation from the theory are discussed at length.  
Kenneth H. Slagle

**2**

**ASB-66A METALLURGICAL LITERATURE CLASSIFICATION**

G-CITY INDEX

FROM SYMBOL	FROM SYMBOL	FROM SYMBOL	FROM SYMBOL
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z	A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

ZHUKHOVITSKIY, A. A.

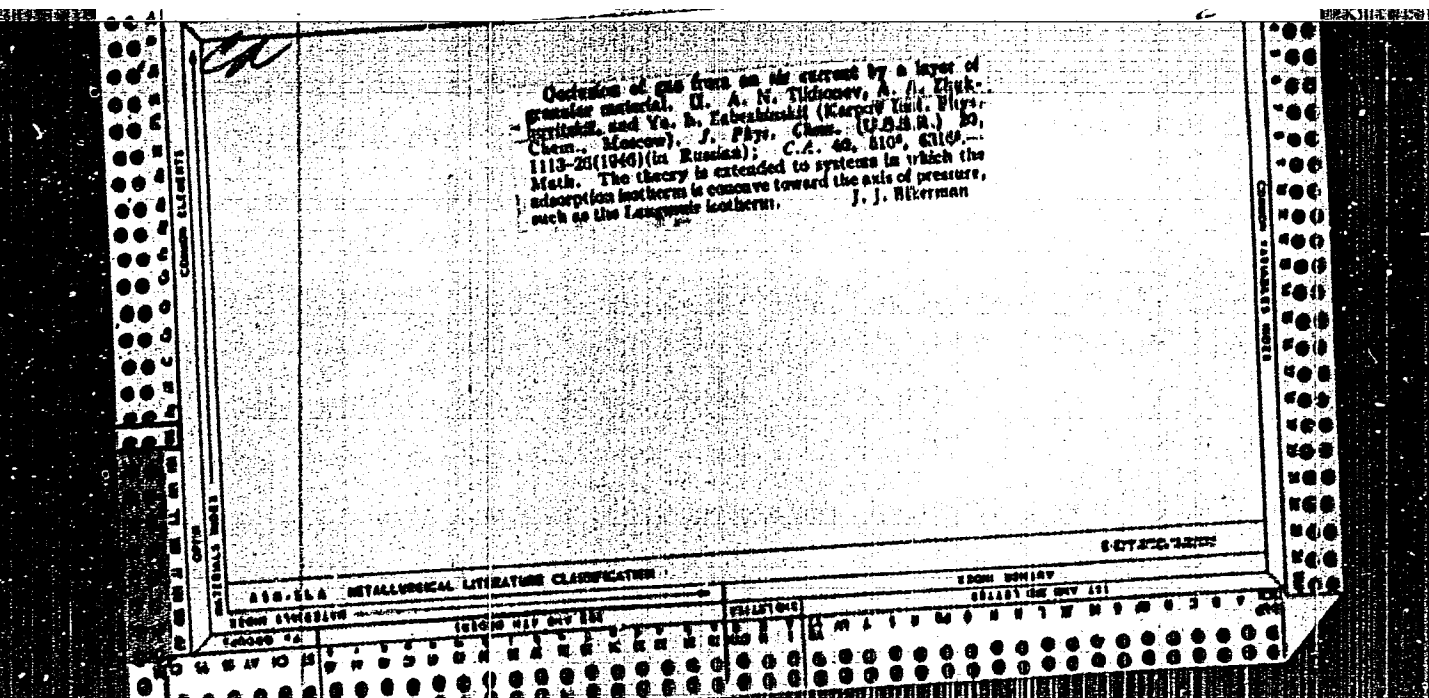
L. Ya. Karpov Physico-Chem. Inst., (-1946-).

"A Contribution to the Theory of the Solutions of High Polymers."

Zhur. Fiz. Khim., No. 3, 1946.

1ST AND 2ND QUANT		PROCESSES AND PROPERTIES INDEX		3RD AND 4TH QUANT	
<p><b>The Surface Strain of Metals.</b> A. Kh. Bryger and A. A. Zhukovitsky (Zhur. Fiz. Khim., 1940, 20, (4/5), 355-362).—[In Russian]. On the basis of Sommerfeld's model, it is shown that the dispersion of a metal leads to an increase in the kinetic energy of the electrons, and this is the fundamental physical cause of the large surface strain of metals. A formula is deduced for calculating surface strain, which gives accurately its order of magnitude and its relation to the density of the electron gas. In the case of a linear model it is shown that surface strain may also be determined by the method of molecular orbits.—N. A.</p>					
<p>ASAC-31A METALLURGICAL LITERATURE CLASSIFICATION</p>					
1ST QUANT		2ND QUANT		3RD QUANT	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

1ST AND 2ND QUARTERS										3RD AND 4TH QUARTERS									
PROCESSES AND PROPERTIES INDEX																			
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<p>4832. Surface tension of [molten] metals. BANCEN, A. K. and ZIMONOVICH, A. A. <i>J. Phys. Chem. USSR</i>, 20, 355-62 (1946) <i>In English</i>.--A mathematical treatment of the Sommerfeld model of the metallic state leads to the conclusion that total surface energy should rise with increasing concentration of a given vol. of metal. The expression <math>\sigma = (p/A)^{1/3}</math> gives values in accordance with experimental data for a number of metals of at. wt. <math>A</math>, and follows from considerations of density of the electron cloud at the surface, and of mol. electronic orbits. B. A.</p>																			
ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION																			
FROM SYNTHESE										FROM POLYMER									
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20										1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20									



ZHUKOVITSKIY, A. A.

"Absorption of Gas from an Air Current by Granular Material,"

Acta Phys., No. 2, Vol. XXI, 1946.

Karpov Inst. of Phy. Chem., Moscow, c1945-.

ZHUKOVITSKIY, A.

USSR/Physics  
Specific Heat

Nov/Dec 46

"The Superficial Density of Specific Heat, " A. Brager, A. Zhukhovitskiy, 18 pp

"Acta Physicochimica URSS" Vol XXI, No 6

Investigates influence of surface on thermal vibrations of a solid following Debye's approximation which results in a calculation of superficial density of specific heats of solids. Considerable difference between specific heat of graphite and that of activated charcoal, observed by Simon and Swain, explained on basis of theory elaborated in the paper. Received, 11 May 1946.

PA 54T84

COMMON ELEMENTS		2	
<p><i>The surface tension of metals.</i> A. Kh. Reger and A. A. Zhukhovitski. <i>Acta Physicochim. U.R.S.S.</i> 21, 12-22 (1946).<sup>222</sup> On the basis of Sommerfeld's model of a metal, it is shown that the principal cause of the high values of the surface tension <math>\sigma</math> of metals is the increase in kinetic energy of the electrons due to the dispersion of the metal. The following equation for calcn. of <math>\sigma</math> of a metal gives the correct order of magnitude of <math>\sigma</math> and indicates its dependence on the d. of the electron gas: <math>\sigma = (\frac{1}{2} \cdot h^2 / 12\pi m) \cdot (N/A)^{1/2} = 50,400(d/A)^{1/2}</math> dyne/cm., where <math>h</math> is Planck's const., <math>m</math> is the mass of the electron, <math>N</math> is Avogadro's no., <math>d</math> is the density of the metal in g./cc., and <math>A</math> is its at. wt. Based on a linear model, <math>\sigma</math> can also be calcd. by the method of mod. orbitals. P. I. Riving</p>			
<div style="display: flex; justify-content: space-between;"> <span>ASTM-BLA METALLURGICAL LITERATURE CLASSIFICATION</span> <span>E-27, AFTER-SERIES</span> </div>			
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ZHUKHOVITSKIY, A. A.

USSR/Chemistry - Atoms  
Chemistry - Adsorption

Apr 1947

"A Possible Mechanism of Interaction Between Adsorbed Atoms," A. Kh. Breger,  
A. A. Zhukhovitskiy, 7 pp

"Zhur Fiz Khim" Vol XXI, No 4

Largely mathematical discussion demonstrating the possibility of the existence of far reaching forces among adsorbed atoms, the emergence of these forces in connection with a change in the energy of the electrodes of the adsorbent, conditioned by the fact that the adsorbed atom "excludes" a definite area from resonance and thus changes the nature of the movement of the remaining adsorbent electrodes.

PA 14T96

ZHUKHOVITSKIY, A. A.

"Absorption of Gas from an Air Current by Granular Material",

Dok. AN, 121, No. 1, Vol. XXII, 1947.

Karpov Inst. of Phys. Chem, Moscow. c1946-.

112 REF. 100 010000

PROPERTIES AND PROPERTIES INDEX

2

Absorption of gas from an air current by granular material. II. A. N. Tikhonov, A. A. Zhukhovitskiĭ, and Ya. L. Zabezhinskiĭ (Karpov Inst. Phys. Chem., Moscow). *Acta Physicochim. U.R.S.S.* 22, 121-30 (1947) (in English). --See C.A. 41, 2958e. A. E. P.

ASA-514 METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNONYM

FROM BOMBING

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ZHUKOVITSKIY, A. A.

USSR/Chemistry - Adsorption  
Chemistry - Adsorbents

Mar 1948

"Adsorption From Solutions on Porous Adsorbents," G. F. Loskhina, E. A. Golbert, A. A. Zhukovitskiy, *Physicochem Inst imeni Karpov, Moscow*, 144 pp

"Zhur Fiz Khim" Vol XIII, No 3

Examines adsorption from solutions of benzol and carbon tetrachloride on seven adsorbents, and adsorption from benzol solutions on three adsorbents. Gives figures on maximum effective adsorption. Hypothesis on negative deviations from Raoult's law permits accurate plotting of the curve of effective adsorption for certain cases. Submitted 23 Jun 1947.

PA 65715

ZHUKOVITSKIY, A. A.

"An Account of the Second Law of Thermodynamics,"  
Uspekhi Khim., 18, No. 3, 1949; Moscow, -c1949-.

ZHUKHOVITSKIY, A. A.

Feb 49

USSR/Physics  
Absorption

"Absorption of Gas From an Air Current by a Layer of Granular Material III," Ya. L. Zabezhinskiy, A. A. Zhukhovitskiy, A. N. Tikhonov, 10 pp

"Zhur Fiz Khim" Vol XXIII, No 2

Conducted experiments with activated carbon using diethyl ether as a sorbate to verify theoretical results of previous reports on certain dependencies of concentration  $C$  at a distance  $L$  upon the time  $\theta$  for various types of isotherms. Submitted 26 Feb 47.

PA 47/49T102

ZHUKHOVITSKIY, A. A.

PA 29/49112

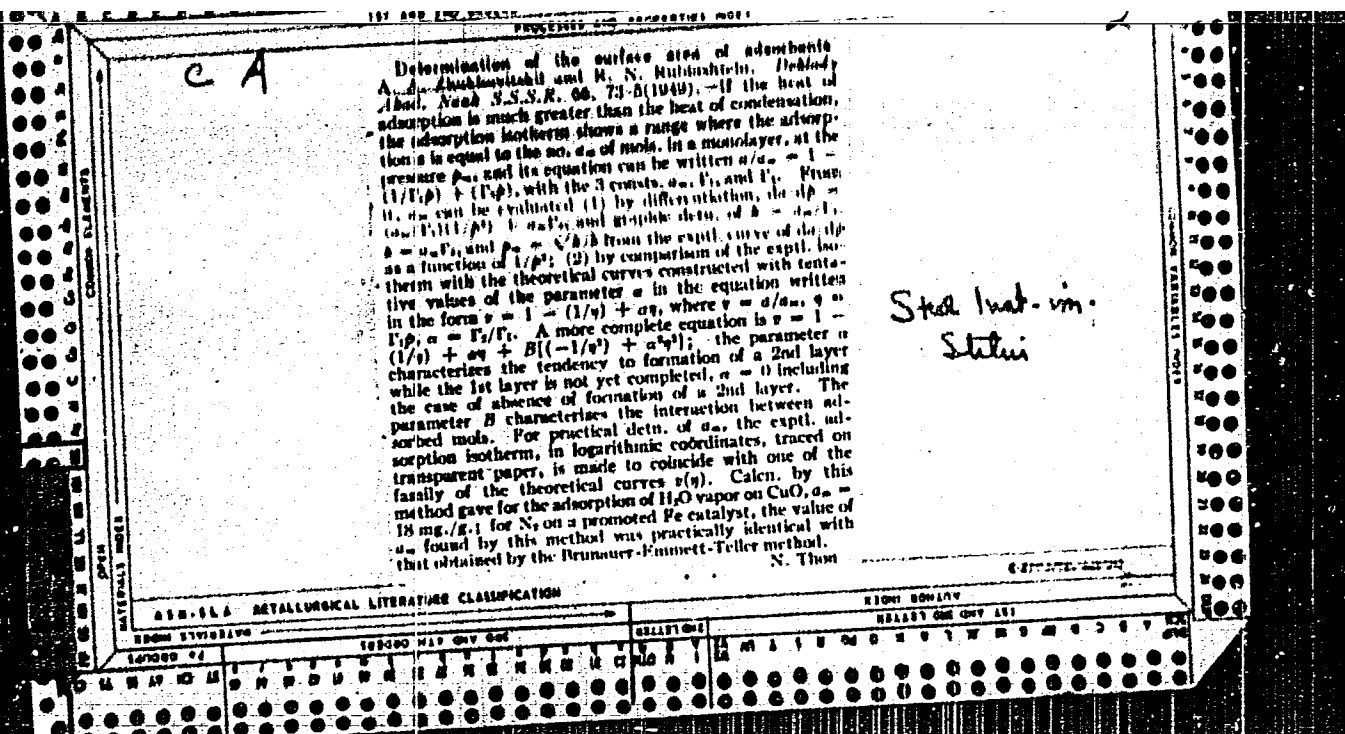
USSR/Chemistry - Absorption, Polymolecular Mar 49  
Chemistry - Absorbents

"The Theory of Polymolecular Absorption," A. A.  
Zhukhovitskiy, R. N. Rubinshteyn, Moscow Inst of Steel  
Imeni Stalin, 4 pp

"Dok Ak Nauk SSSR" Vol LXV, No 1

Presents formulation of theory which calculates inter-  
action between the absorbed molecules, methods of per-  
forming calculations, approximate formulas, and con-  
sideration of the principles and areas of application  
of Brunauer's formula. The theory holds for smooth,  
homogeneous absorbent. Submitted by Acad N. N.  
Semenov, 7 Jan 49.

29/49112





Author: Zhukhovitskii, A.A., et al.

Title: A new method of chromatographic analysis.

Journal: Doklady Akademi Nauk SSSR, 1951, Vol.77, No.3, p. 435

Subject: Physical Chemistry

From: D.S.I.R. Oct 51

ZHUKHCVITSKIY, A.A.

"Application of Artificial Radioactivity to Industry"  
Primeneniye Iskusstvennoy Radioaktivnosti v Promyshlennosti 1951  
U-1869

C-2

B.A.

1364. New chromatographic procedure. A. A. Zhukovitskiy, O. V. Zolotareva, N. A. Sokolov, and N. M. Turkel'taub (Zh. Fiz. Khim., U.R.S.S., 1961, 77, 435-438).—A mixture of aliphatic hydrocarbons (methane to butane and also isobutane) is passed into a vertical column of  $\text{SiO}_2$ -gel down which a steady stream of warm air is passed. The column is packed in a thermostatic sleeve, and an annular heating unit moves at a uniform rate down the column, thus thermally desorbing the components of the mixture, the concn. of which is determined interferometrically in the issuing air. The number and concn. of the constituents is indicated by a series of peaks on the curve relating interferometer reading with vol. of air passed. The method is termed chromathermography.

R. Tallico.

ZHUKHOVITSKIY, A.A.; TURKEL'TAUB, N.M.; SOKOLOV, V.A.

Theory of chromathermography. Doklady Akad. Nauk S.S.S.R. 88, 859-62 '53.  
(CA 47 no.22:11882 '53) (MIRA 6:2)

ZHUKHOVITSKIY, A. A.

260125

USSR/Metallurgy - Diffusion in Metals 21 May 53

"Method for Determination of Diffusion Coefficients," S. N. Kryukov, A. A. Zhukhovitskiy,  
② Moscow Inst of Steel im I. V. Stalin

2 DAI SSSR, Vol 90, No 3, pp 379-382

Reviews existing methods for detg diffusion coeffs, outlining their deficiencies. Suggests new method, whose essential features are: quickness and simplicity of detn, possibility of detg diffusion coef at low temps, and possibility of using small specimens. Method

260T25

consists of application of radioactive element on one side of thin specimen followed by diffusion annealing and activity detn on both sides as function of time. Demonstrates test of method on Ag specimens. Presented by Acad N.T. Gudtsov 23 Mar 53.

ZHUKOVITSKIY, A. A.

Chem

nuclear Sci. Abs.  
V-7 Nov 30, 1953  
Physics

**A METHOD FOR DETERMINING DIFFUSION COEFFICIENTS.** S. N. Kryukov and A. A. Zhukovitskiy (Zhukovitsky). Translated from Doklady Akad. Nauk S.S.S.R. 80, 879-82(1953). 4p. (NSF-tr-71; D-90-379)

In the method proposed, a layer of a radioactive element is deposited on one side of a thin sample (30 to 100  $\mu$ ). After diffusion annealing, the radioactivity of both sides of the sample is determined as a function of annealing time. The expression for the dependence of the counting rates  $I_1$  and  $I_2$  of the two sides of the plate on the time  $t$  of the diffusion annealing is  $\ln \frac{I_1 - I_2}{I_1 + I_2} = \ln K - \frac{\pi^2 D}{l^2} t$ , where  $K$  is a constant independent of the time and the diffusion coefficient,  $l$  the width of the sample, and  $D$  the diffusion coefficient. The method was tested on Ag, and agreement with reported values was good. (U.S.R.)

MF  
7-27-54

ZHUKOVITSKIY, A-A.

B. T. R.  
June 1954  
Chemistry-Physical

(3) Phys.

7734\* Continuous Chromathermography. (Russian.) A. A. Zhukhovitskiy, N. M. Tinkelman, and I. Y. Georgievskaya. Doklady Akademii Nauk SSSR, v. 92, no. 8, Oct. 11, 1953, p. 987-990.

New variation of adsorption analysis, theoretical bases, operating technique, and field of application. A series of examples illustrate practical utilization. Graphs.

*[Handwritten signature]*

ZHUKHOVITSKIY, A.A., professor, doktor khimicheskikh nauk (Moscow)

Nuclear reactions and their use. Fiz. v shkole 14 no.4:9-19  
Jl-Ag '54. (MLRA 7:7)  
(Nuclear physics)



ZHUKHOVITSKIY, A. A.

USSR/Chemistry - Physical chemistry

Card 1/1 : Pub. 147 - 6/22

Authors : Zhukhovitskiy, A. A.; Turkel'taub, N. M.; and Shvartsman, V. P.

Title : On the theory of chromatography

Periodical : Zhur. fiz. khim. 28/11, 1901-1909, November 1954

Abstract : The factors leading to blurring of the spectral band during chromatography are discussed. An analysis of special experiments led to the conclusion that the basic factor resulting in blurring of the adsorbate band in the investigated zone of concentration is the linear (longitudinal) diffusion. The coefficients of such linear diffusion were calculated. It was established that the utilization of narrow adsorption tubes and fine granulation brings about a considerable reduction in band blurring. Six USSR references (1947-1954). Tables; graphs.

Institution : .....

Submitted : January 26, 1954

Zhukhovitskiy, A.A.

KULIKOV, I.S., kandidat tekhnicheskikh nauk; ZHUKHOVITSKIY, A.A., professor,  
doktor khimicheskikh nauk.

Using radioactive tracers to investigate the kinetics of reactions  
between metal and slag. Sbor.Inst.stali no.32:54-78 '54.  
(MLRA 10:5)

1.Kafedra fizicheskoy khimii.  
(Diffusion) (Radioactive tracers)

in

New method of chromatographic analysis. A. A. Zhukhovitskiĭ, O. V. Zolotareva, V. A. Sokolov, and N. M. Turkel'taub. *Doklady Akad. Nauk S.S.S.R.* 77, 435-8 (1964).—A stream of diluent (air) is applied while the furnace which heats consecutive sections of the adsorbing column, and causes desorption, is moved down the column. This "chromathermographic" method permits variation of several factors, including the velocity of the air stream, the temp. of the furnace, and its velocity. If the velocity of the stream  $u$ , and the velocity of the furnace  $V$ , are sufficiently slow, adsorption equil. will be established. The velocity of the  $i$ th component is  $W_i = u/H_i$ , where the Henry coeff.  $H_i = A_i/Q_i$ , with  $Q_i$  = heat of adsorption. In the stationary state  $V = W_i$ . The air stream thus distributes the components at different spots of the temp. field, and keeps them sep'd. by preventing either acceleration or slowing down. In a homologous series, by Traube's rule,  $Q = D + n\Delta$ , where  $n$  = no. of C atoms; the temp. of the point at which the  $n$ th component is localized is det'd. by  $Q_i/T_i = \text{const.}$  If the temp. gradient is const., the point of localization of the  $n$ th component is a linear function of  $n$ , i.e. the distance between 2 components remains const. The method is illustrated by a plot of sepa. of 106 g. of a mixt.  $C_3H_8 + C_4H_{10} + C_5H_{12} + C_6H_{14} + C_7H_{16} + C_8H_{18}$  + iso-mixt.  $C_3H_8 + C_4H_{10} + C_5H_{12} + C_6H_{14} + C_7H_{16} + C_8H_{18}$ , in terms of the vol. of air passed for  $u = 40$  cc./min.,  $d = 1-2$  mm.,  $V/u = 60$  m.,  $T_i = 150^\circ$ . The plot shows 7 distinct peaks. N. Thon

ЗНАКОМСТВО  
Theory of thermal separation of gas mixtures by the  
absorption method

См. 1-2

ZHUKHOVITSKIY, A. A.  
USSR/Physical Chemistry

Card 1/1

Authors : Zhukhovitskiy, A. A., Turkel'taub, N. M., Vagin, E. V., and Shvartsman, V. P.

Title : Blurring of bands during chromatographic and thermal separation

Periodical : Dokl. AN SSSR, 96, Ed. 2. 303 - 306, May 1954

Abstract : Report offers a theory and experimental data pertaining to chromatographic and thermal separation. It is shown that, at the assumed rates of the gaseous mixture, the basic factor leading to blurring of bands is the linear diffusion at greater rates with sorption as the finality. Report also contains data on the verification of the theory and calculation (from experimental values) of constants which characterize this phenomenon. Three USSR references. Tables; graphs.

Institution : All-Union Scientific-Research Geological-Exploratory Petroleum Institute

Submitted : February 1, 1954

ZHUKOVITSKIY, A. A.

"Method of Investigating Diffusion With Radioactive Isotopes".

Report appearing in 1st Volume of "Session of the Academy of Sciences USSR on the Peaceful Use of Atomic Energy, 1-5 July 1955", Publishing House of Academy of Sciences USSR, 1955.

SO: Sum 728, 28 Nov 1955.

ZHUKHOVITSKIY, Aleksandr Abramovich, doktor khimicheskikh nauk, professor  
KIPNIS, S. Ye., redaktor; ISLENT'YEVA, P.G., tekhnicheskiiy redaktor.

[Tagged atoms] Mechenye atomy. Moskva, Izd-vo "Znanie," 1955. 39 p.  
(Vsesoiuznoe obshchestvo po rasprostraneniю politicheskikh i nauch-  
nykh znaniy, Seriya III, no. 5.) (MLRA 8:8)  
(Radioactive tracers)

**ZHUKHOVITSKIY, A.A.**

Development and theory of the adsorption method of M.S. TSvet. Trudy  
Kom.anal.khim. 6:33-45 '55. (MLBA 9:5)

1. Nauchno-issledovatel'skiy institut geofizicheskikh i geokhimicheskikh metodov razvedki Ministerstva neftyanoy promyshlennosti.  
(Chromatographic analysis)



ZHUKHOVITSKIY, A.A.

AID P - 3168

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 3/8

Author : Zhukhovitskiy, A. A. (Moscow)

Title : Use of radioactive isotopes for measuring the rate of diffusion in solids.

Periodical : Usp. khim., 24, 5, 575-584, 1955

Abstract : The method described consists in determining the distribution of the radioactive isotope diffused into the sample. Self-diffusion and heterogeneous diffusion are discussed. Methods for calculation of the distribution are reviewed. One table, 15 references, 10 Russian (1937-1955).

Institution : None

Submitted : No date

ZHUKHOVITSKIY, A.A.

Equation for the adsorption kinetics of activated charcoal. Zhur.  
fiz.khim.29 no.5:933 My'55. (MLRA 8:12)  
(Adsorption) (Carbon)

ZHUKHOVITSKIY, A.A., professor, doktor khimicheskikh nauk; KIDIN, I.N.,  
kandidat tekhnicheskikh nauk, dotsent; TRUBIN, I.G., professor,  
doktor.

Preface. Sber.Inst.stall 34:5-6 '55. (MIRA 9:7)  
(Physical metallurgy) (Radioactive tracers--Industrial applications)

*ZHUKHOVITSKIY, A.A.*  
Category : USSR/Solid State Physics - Diffusion. Sintering

E-6

Abs Jour : Ref Zhur - Fizika, No.1, 1957, No 1252

Author : Zhukhovitskiy, A.A., Kryukov, S.N., Yanitskaya, M.Ye.  
Title : Self-Diffusion and Diffusion in Binary Solid Solutions

Orig Pub : Primeneniye radioaktivnykh izotopov v metallurgii, M., Metallurgizdat,  
1955, sp. 34, 7-35

Abstract : The dependence of the self-diffusion coefficient on the concentration of the solution and its relationship to the coefficient of diffusion are examined within the framework of the method of the transition state for the "vacancy" mechanism and of the exchange state. An analysis is made of the relationship between the coefficient of self-diffusion in a solution and the coefficient of self-diffusion in a pure component and in an infinitely-dilute solution of this component in another component; the connection between the diffusion and thermodynamic characteristics of solutions is also analyzed. The thin-layer method is used to measure the concentration dependence of the coefficient of self-diffusion in the Ag-Au, Ag-Cu and Ag-Sn systems and the activity coefficients are measured for the Ag-Au system by new methods, explained in the article. Analysis of the experimental data confirms the deduced existence of

Card : 1/2

Category : USSR/Solid State Physics - Diffusion. Sintering

E-6

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1252

two processes, which manifest themselves in the  $[\ln D \text{ vs. } (1/T)]$  curve as a discontinuity, similar to that caused by the boundary diffusion. The substantial effect of slight copper impurities on the coefficient of diffusion of silver illustrates the lack of adequate thermodynamic data on the solution.

Card : 2/2

ZHUKHOVITSKIY, A. A. (Prof.) (Dr. Chem. Sci.); GEODAYKYAN, V. A.;

"The Measurement of Low Diffusion Coefficients," in book The Application of Radioisotopes in Metallurgy, Symposium XXXIV; Moscow; State Publishing House for Literature on Ferrous and Nonferrous Metallurgy, 1955.

Prof. A. A. ZHUKHOVITSKIY, Dr. Chem. Sci.; V. A. Geodaykyan, Assistant, Chair of Physical Chemistry, Moscow Inst. of Steel im I. V. Stalin.

ZHUKHOVITSKIY, A. A. (Prof., Dr. Chem. Sci.); CHELISHCHEV, E. V.; VISHKAREV, A. F. (Engr.)

"Exchange and Distribution of Iron Between the Slag and Metal Phases in a Steel Smelting Process," in the book The Application of Radioisotopes in Metallurgy, Symposium XXXIV; Moscow; State Publishing House for Literature on Ferrous and Nonferrous Metallurgy, 1955.

E. V. CHELISHCHEV; A. F. VISHKAREV, Engr.; Prof. A. A. ZHUKHOVITSKIY, Dr. Chem. Sci., Scientific Consultant/Chair of Theoretical Metallurgy, Moscow Inst. Steel im I. V. Stalin.

ZHUKHOVITSKIY, A. A. (Prof., Dr. Chem. Sci.); KRYUKOV, S. N.; GEODAKYAN, V. A. (Engr.)

"The Measurement of Diffusion Coefficients," in book The Application of Radio-isotopes in Metallurgy, Symposium XXXIV; Moscow; State Publishing House for Literature on Ferrous and Nonferrous Metallurgy, 1955.

ZHUKHOVITSKIY, A. A. (Prof., Dr. Chem. Sci.); S. N. KRYUKOV, Assistant; V. A. GEODAKYAN, Engr./Chair Physical Chemistry, Moscow Inst. of Steel im I. V. Stalin.



<sup>H</sup>  
ZHUKOVITSKIY, A. A. (Prof., Dr. Chem. Sci.); REITBLATT, V. L. (Engr.); FUNKE, V. F.;  
BOGDANOV, N. A.;

"The Reflection of Beta Radiation and the Analysis of Metals," in book The Application of Radioisotopes in Metallurgy, Symposium XXXIV; Moscow; State Publishing House for Literature on Ferrous and Nonferrous Metallurgy, 1955.

Prof. A. A. ZHUKOVITSKIY, Dr. Chem. Sci.; V. L. REITBLATT, Engr.; V. F. FUNKE, Assistant; N. A. BOGDANOV, Assistant/Chair of Physical Chemistry; Chair of Rare Metals Metallurgy, Moscow Inst. of Steel im I. V. Stalin.

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 30/49

Authors : Zhukovskiy, A. A. (Moscow Steel Inst. im. I. V. Stalin)

Title : Diffusion method of determining the thermodynamic properties of solid solutions

Periodical : Dok. AN SSSR 102/1, 121-124, May 1, 1955

Abstract : A new simple method for the determination of thermodynamic properties of solid solutions is described. The characteristics originating from the measurement of the diffusion coefficient and the macroscopic characteristics of the solid solutions are determined. The method is applied to the determination of the thermodynamic properties of solid solutions of iron and carbon. The results are compared with the data obtained by other methods. Table, graphs, appendix.

Institution : The Moscow Steel Inst. im. I. V. Stalin

Presented by : Academician N. T. Gudtsov, December 9, 1954

~~Zhukhovitskiy, A. A.~~  
USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 29/59

Authors : Zhukhovitskiy, A. A., and Geolakyan, V. A.

Title : Determination of diffusion coefficients on the basis of beta-radiation absorption

Periodical : Dok. AN SSSR 102/2, 301-304, May 11, 1955

Abstract : Description is given of a new method for the determination of diffusion coefficients in solid fusions. The method is based on the measurement of activity drops caused by the diffusion of a radioactive substance into a metal layer. The results obtained by this method are demonstrated. It is pointed out that the method is simple and reliable and can be used to obtain an experimental determination of the diffusion coefficient.

USSR and ...  
Institution : Moscow Inst. of Steel im. I.V.Stalin

Presented by : Academician V. N. Kondratyev, December 9, 1954

*Translation W-31636, 30 Jan 56*

USSR/ Chemistry - Physical Chemistry

Card 1/1 Pub. 22 - 31/53

Authors : Zhukhovitskiy, A. A.; Vagin, Ye. V.; and Petukrov, S. S.

Title : ~~XX~~  
About the fractional inhibition method

Periodical : Dok. AN SSSR 102/4, 771-774, Jun 1, 1955

Abstract : It is shown that a combination of adsorption and thermal factors makes it possible to carry out numerous effective chromatographic separations of mixtures, especially gas mixtures. A new fractional inhibition method is introduced which solves the problem of the concentration of adsorption

Institution : All-Union Sc. Res. Inst. of Oxygen Machine Building

Presented by: Academician P. A. Rebinder, December 20, 1954

CHUKHOVITSKIY, A. N.

Methods of investigating diffusion with radioactive isotope

Korotkiy, A. N. Zhukhovitskiy, A. N.

1954

1444

3024  
RST

RMK 21

ZHUKHOVITSKIY, A.A.

137-58-5-10971

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 296 (USSR)

AUTHORS: Valov, G.G., Dobrzhanskiy, A.V., Zhukhovitskiy, A.A.

TITLE: Analysis by Beta-ray Reflection (Analiz metodom otrazheniya  $\beta$ -izlucheniya)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii. Ukr. resp. pravl., 1956, Vol 4, pp 22-29. Comments pp 30-31

ABSTRACT: A description is presented of an instrument for analysis of the percentage content of heavy elements by  $\beta$ -ray reflection. When radioactive radiation passes through a substance, the interaction of  $\beta$  particles with the atomic nuclei of the substance causes the particles to be deflected from their original direction. The intensity of the reflected  $\beta$  radiation (RI) is approximately proportional to  $Z^{2/3}$ , where Z is the charge on the nucleus or the atomic number of the element. Consequently, the RI may be employed to judge the composition of the substance.  $Tl^{204}$ , with a half life of 2.7 years, is used as a source of  $\beta$  radiation. 20 millicuries of  $Tl^{204}$  are placed on the bottom of a Pb cup which directs the beam of electrons (E) upward onto the specimen under investigation. The reflected E pass through a filter to an

Card 1/3

137-58-5-10971

### Analysis by Beta-ray Reflection

ionization chamber with a cylindrical tinplated brass body 300 mm in diameter and height. The collecting electrode, in the form of a centrally-positioned pin, is introduced into the chamber through a polystyrene insulator and is under a potential of +300 v relative to the housing. The thickness of the filter is selected experimentally so that the majority of the E reflected from the heavy element will pass through it, and the E reflected from the rest of the substance will be retained therein. The result may thus be attained that the magnitude of the RI is in linear relation to the content of heavy element. The RI passing through the filter ionizes the air in an ionization chamber. The resultant weak ionizing current is amplified and delivered to a galvanometer. To prepare the specimen, 10 or 20 g of the material, reduced to powder for analysis in the usual way and screened through a 100-mesh sieve, is sifted into a metal adapter, the bottom of which may be made of any material transparent to  $\beta$  rays, e.g., tracing cloth. The powder is gently packed by tapping the adapter against the table. Analysis is performed either by plotting a graduated curve against standard specimens or by comparison with a standard. The method has been used specifically for determination of Fe in Fe ore and of W in high-speed steel. The employment of this method in analysis of Fe ore shows that its accuracy corresponds to that of rapid chemical analysis, but the time is reduced to 1.5-2.0 min. The method is simple in execution and

Card 2/3

137-58-5-10971

Analysis by Beta-ray Reflection

does not consume any reagents whatever. The instrument is compact and can be used anywhere. The immediate and prospective value of this new method are noted in the discussion.

T.M.

1. Beta rays--Reflection
2. Heavy elements--Analysis

Card 3/3



*Zhukhovitskiy, A.A.*

USSR/ Analytical Chemistry - General Questions

G-1

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11986

Author : Turkel'taub N.M., Zhukhovitskiy A.A.

Title : Chromatographic Methods of Gas Analysis

Orig Pub : Zavod. laboratoriya, 1956, 22, No 9, 1032-1039

Abstract : A review. Bibliography 51 references.

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240 K Hovitskiy, A.A.

G-3

USSR/Analysis of Organic Substances.

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 19684.  
Author : A.A. Zhukhovitskiy, H.M. Turkel'taub.  
Title : Equipment for Continuous Analysis of Gases.  
Orig Pub : Zavod. Laboratoriya, 1956, 22, No 10, 1252-1255

Abstract : A horizontal thermodynamic equipment for the continuous gas analysis is described; it consists of a circularly bent adsorption tube with silica gel and two vertical outlets, an electric stove and an outlet system (a three-way crane, a drier with NaOH and a speed regulator). The equipment includes two devices, one for measuring the thermal conductivity of gases, the other for measuring the thermal effect of combustion. The stove (temperature 50 to 200°) moves along the adsorption tube (speed about 9 cm/min). The analysed gas is continually fed into the tube at a speed of about 120 ml/min; the gas enters the two described devices from the outlet. A fixed

Card 1/2

-4 -

USSR/Analysis of Organic Substances.

G-3

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 1968<sup>4</sup>

temperature gradient is maintained in the described system; the picking is carried out at a certain place in the layer at a fixed temperature. The component concentration is determined according to the heights of maximums of a calibrating curve plotted in advance. The separation of mixtures propane-butane-isopentane-hexane and ethylene-propylene-butylene was achieved. The sensitivity of the method is 0.001% for heavy hydrocarbons; the relative accuracy is about 8%. The analysis duration of gaseous mixtures is 5 to 10 min.

Card 2/2

- 5 -

ZHUKHOVITSKIY, A. A.

APPROVED FOR RELEASE: 09/19/2001. Adm. 12  
Chromatography. Ion Exchange

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 4000

Author : Zhukhovitskiy A.A., Turkeltaub N.M.

Title : Chromatographic Method of Separation and Analysis of Gases

Orig Pub : Uspekhi khimii, 1956, 25, No 7, 859-871

Abstract : Presentation of the results of the work by the authors and their associates on the problem stated in the title. Bibliography 41 references.

Card 1/1

- 230 -

ZHUKHOVITSKIY A.A.

GRUZIN, P. L., FRANTSEVICH, I. N., ZHUKHOVITSKIY, A. A., BORISOV, V. T.,  
and BOKSHTEYN, S. Z.

"Concerning the Diffusion and Electric Transmission of Carbon in Iron and its Alloys"

report presented at the UNESCO Conference on the Utilization of Radioactive Isotopes in Scientific Research, Paris, 9-20 Sept 1957.  
Vestnik AN SSSR, 1958, v. 28, No. 1, pp. 71-78. (author Vinogradov, A. P.)

*ZHUKHOVITSKIY, A. A.*

ZHUKHOVITSKIY, A. A., YANITSKAYA, M. E., and SOTSKOV, A. D.

"Application of radio-active isotopes in solving diffusion in metals theory problems," a paper submitted at the International Conference on Radiotopes in Scientific Research, Paris, 9-20 Sep 57.

~~ZHUKHOVITSKIY, A.A., professor, doktor tekhnicheskikh nauk.~~

"Physical principles in the method of radioactive tracers" by  
S.M. Raiskii, V.F. Smirnov. Reviewed by A.A. Zhukhovitskii. Zav.  
lab. 23 no.5:639-640 '57. (MIRA 10:8)  
(Radioactive tracers) (Raiskii, S.M.) (Smirnov, V.F.)

2 HUKHUVITSKIY, A. A.  
TUREL' TAUB, N.M.; ZHUKHVITSKIY, A.A.

Theory of chromatographic methods of gas analysis. Zav.lab. 23  
no.9:1023-1034 '57. (MIRA 10:12)  
(Chromatographic analysis) (Gases--Analysis)

ZHUKOVITSKIY, A. A.

76-10-18/34

**AUTHORS:** Geodakyan, V. A.,  
Zhukhovitskiy, A. A.

**TITLE:** Sensitive Method for Determining Diffusion Coefficients  
(Chuvstvitel'nyy metod izmereniya koeffitsiyentov  
diffuzii).

**PERIODICAL:** Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 10,  
pp. 2295-2301 (USSR)

**ABSTRACT:** A new sensitivity measuring method for diffusion coefficients by means of marked (tracer) atoms is given. The task consists of the working out of the method for measuring the concentration at the surface as a time function of the annealing. The activity of the surface layer is measured by taking a "print" of the surface. At first the autodiffusion is investigated and then the right carrying out of the experiment under application of the "print" method in order to obtain the characteristics of the autodiffusion and of the heterodiffusion in solutions. The new method has following advantages: high sensitivity, simplicity, and universality with respect to the radiation character. The autodiffusion

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Sensitive Method for Determining Diffusion Coefficients

76-10-18/34

coefficients of silver and iron were measured. The values obtained for  $\gamma$ -iron agree with those in the references, whereas the values for  $\alpha$ -iron differ to a great extent from the reference data. There are 4 figures, 4 tables, 5 Slavic references.

ASSOCIATION: Institute for Steel imeni I. V. Stalin, Moscow  
(Institut stali im. I. V. Stalina, Moskva).

SUBMITTED: August 23, 1956

AVAILABLE: Library of Congress

CARD 2/2

SOTSKOV, A.D.; ZHUKHOVITSKIY, A.A.

Hydrodynamic flow in phase transformations. Nauch. dokl. vys.  
shkoly; met. no.1:182-187 '58. (MIRA 11:9)

1. Moskovskiy institut stali.  
(Phase rule and equilibrium) (Diffusion)

ZHUKHOVITSKIY, A.A.; SOTSKOV, A.D.

Use of radioactive indicators in studying reactive diffusion.  
Nauch. dokl. vys. shkoly; met. no.1:211-217 '58. (MIRA 11:9)

1. Moskovskiy institut stali.  
(Diffusion) (Radioactive tracers)

ZHUKHOVITSKIY, A. A.

V.A.Sokolov, N.M.Turkel'taub and A.A. Zhukhovitskiy "Gasanalytical methods and apparatus for geochemical research."

report presented at a Conference in the Dept. of Geological and Geographical Sci., on Geochemical and Radiometrical Methods of Search and Prospecting for Deposits, 21-26 April 1958.  
(Vest. Ak Nauk SSSR, 1958, No. 7, pp. 125-26)

AUTHORS: Zhukhovitskiy, A. A., Turkel'taub, N. M. SOV/32-24-7-4/65

TITLE: The Errors in Chromatographic Analysis Connected With Incomplete Separation (Oshibki khromatograficheskogo analiza, svyazannyye s nepolnotoy razdeleniya)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 796 - 798 (USSR)

ABSTRACT: The problem is investigated, to what value the errors of determination may rise, if no zeros exist between the maxima of the curve, and which method exhibits the smallest error caused by insufficient separation. If the adsorbability of the component is linearly dependent upon the concentration, Gauss's equation may be used. A formula for the determination of the error by the method of the "heights of the maxima" and by the method of the "areas" is given. In this method the error is determined from the difference between the amount of substance of the first component which falls to the zone of the second component, and that of the second component, which falls to the zone of the first one. In the second case the ordinate of the minimum of the curve of determination is measured, and then a

Card 1/2

The Errors in Chromatographic Analysis Connected With Incomplete Separation SOV/32-24-7-4/65

Graphical representation of the error function versus the concentration ratio of the components ( $m$ ) is given. It is found, that in determinations carried out according to the first method the maximum error (6%) occurs at  $m=1$ , the error decreasing at an increase of  $m$ . With the second method, the error at  $m=1$  equals zero, and in actual cases ( $m < 500$ ) does not exceed 15%. It may be seen from the diagram that at  $m < 1,5$  the method of "areas", and at  $m > 1,5$  the method of the "heights of maxima" must be applied. In order to achieve a greater precision in the determinations it is recommended to use a correction curve or table. There are 1 figure, 1 table, and 2 references, which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy geologo-razvedochnyy neftyanoy institut (Scientific Research Institute of Geological Prospecting for Petroleum)

Card 2/2

AUTHORS: Zhukhovitskiy, A. A., Golitsyn, A. G. SOV/32-24-7-20/65

TITLE: A New Method of Measuring the Thermodynamic Characteristics of Solid Solutions (Novaya metodika izmereniya termodinamicheskikh kharakteristik tverdykh rastvorov)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 7, pp. 828-829 (USSR)

ABSTRACT: In order to avoid the sources of error connected with the methods of Langmuir and Knudsen a method is advocated, according to which the solution temperatures of the component of the solid solution to be investigated in the solvent is to be measured. Care must be taken that the elements introduced into the solvent exhibit a low solubility in the solid sample and that the solubility of all components of the solid in the solvent also is small. According to evidence taken from publications, silver is satisfactorily meeting these demands for the system iron-carbon. From the described course of investigation it appears that the experiments were conducted at a vacuum of  $\sim 5 \cdot 10^{-5}$  torr and at a temperature of from 1000 to 1100° with the radioactive isotope  $\text{Fe}^{59}$ . Effects equal to those found by Ye. Z. Vintaykin (Ref 2) were establish-

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SCV/32-24-7-20/65

A New Method of Measuring the Thermodynamic Characteristics of Solid Solutions

ed. From the results given in a table showing the percents by weight of carbon and the heat of solution it can be seen that the greatest difference of the latter amounts to 1800 cal/mol which corresponds to the heat of dilution of austenite with iron. It is assumed that the total error in the heat determinations is better than 10 %. Hence, the measured heat of dilution is within the limits of experimental accuracy. It does, however, not exceed 3000 cal/mol. The results substantiate the theory which considers deviations of carbon solutions in iron from ideal conditions as being of an entropic type. There are 1 figure, 1 table, and 4 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali im. Stalina  
(Moscow Institute of Steel imeni Stalin)

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5(2), 21(8)

SOV/32-24-11-2/37

AUTHORS:

Kryukov, S. N., Bokshteyn, B. S., Degal'tseva, T. I.,  
Zhukhevitskiy, A. A.

TITLE:

The Analysis of Compound Systems by the Method of  $\beta$ -Radiation  
Reflection (Analiz slozhnykh sistem metodom otrazheniya  $\beta$ -  
izlucheniya)

PERIODICAL:

Zavodskaya Laboratoriya, 1958, Vol 24, Nr 11, pp 1305-1308  
(USSR)

ABSTRACT:

The discovery of Mueller (Myuller) (Ref 2), that the reflex  
effect is determined by the central charge does not prove to  
be true in a number of cases. In order to analyze ternary and  
more complex systems composed of components with various  
nuclear charges the method of  $\beta$ -radiation reflection was further  
developed. Measurement of the reflected radiation after it  
has passed through filters of various thicknesses is suggested  
by the authors. Using this method the three-component system  
Fe - Mo - W was analyzed, and the iron content of ores was  
determined. The iron-molybdenum-tungsten mixture was prepared  
from chemically pure powders of these elements. The measuring  
apparatus was previously described (Ref 3). Sr<sup>90</sup> and Y<sup>90</sup> mix-

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SOV/32-24-11-2/37

The Analysis of Compound Systems by the Method of  $\beta$ -Radiation Reflection

tures were used as radiation sources. Using a thin aluminum filter it was observed that the reflected  $\eta_2$  depends to a great extent upon the composition. With thicker filters the reflected  $\eta_1$  is determined only by molecules of moderate weight. A graphical determination based upon the reflection as a function of the iron content at a given molecular weight (thin aluminum filter, 0.15 mm) together with the results using a thicker aluminum filter make possible a determination of the composition of a mixture. Measurements on a series of ores and artificial mixtures (ordered from "Gikyuzhruda") showed that the reflection through thin filters is insufficient as a basis for the analysis of ores. The values of  $\eta_1$  and  $\eta_2$  must first be determined, and then from the standard curve formed from the intersection of the  $\eta_2$  straight line with the straight line of the constant  $\eta_1$  the iron content can be determined.

There are 5 figures and 3 references, 2 of which are Soviet.

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The Analysis of Compound Systems by the Method of  $\beta$ -Radiation Reflection

SOV/32-24-11-2/37

ASSOCIATION: Moskovskiy institut stali im. I. V. Stalina (Moscow Steel  
Institute imeni I. V. Stalin)

Card 3/3

18(7)

SOV/20-121-6-17/45

AUTHORS:

Bokhshteyn, S. Z., Gudkova, T. I., Zhukhovitskiy, A. A.,  
Kishkin, S. T.

TITLE:

On the Influence of Irreducible Structure Modifications Which  
Occur During a Plastic Deformation on the Diffusion Mobility  
(O vliyanii neobratimyykh strukturnykh izmeneniy, vznikayushchikh  
pri plasticheskoy deformatsii, na diffuzionnyu podvizhnost')

PERIODICAL:

Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 6, pp 1015-1018  
(USSR)

ABSTRACT:

This paper investigates the influence of a previous plastic  
deformation at a high temperature on the diffusion of zink  
in nickel. This investigation is carried out separately for  
the volume and for the boundaries of the grains. The previous  
deformation of the plain samples were carried out by means of  
expanding tensions  $\sigma = 6 \text{ kg/mm}^2$  at a temperature of  $700^\circ$  in  
the course of 5; 25; 50; and 60 hours. The diffusion currents  
were determined by autoradiography of an oblique section. The  
experimental results are given in a table and in a diagram.  
According to these results, a previous deformation increases  
considerably the velocity of the diffusion of tin in nickel

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SOV/20-121-6-17/45

On the Influence of Irreducible Structure Modifications Which Occur During  
a Plastic Deformation on the Diffusion Mobility

(on the boundary and also in the volume). The volume modification is modified much more than the diffusion on the boundaries. For small deformations, the effect upon the boundaries and upon the grain has the same intensity. According to the analysis of the autoradiograms, the diffusion mainly takes place along the grain boundaries. The influence of the grain boundaries on the diffusion velocity decreases if the previous plastic deformation becomes more intensive. The above-given results may be explained by the following assumption: The plastic deformation at high temperatures causes essential modifications of the microstructure of the alloy. These modifications are irreversible or the initial state may be restored only by a heating of the samples to sufficiently high temperatures. According to an X-ray investigation, the above-discussed previous deformation at high temperatures noticeably diminishes the size of the blocks left after diffusion tempering. The results found for the diffusion of tin in nickel at 800° in the course of 100 hours are given in a table. The irreducible modifications of the structure exercise considerable influence on the diffusion mobility during

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SOV/20-121-6-17/45

On the Influence of Irreducible Structure Modifications Which Occur During  
a Plastic Deformation on the Diffusion Mobility

the plastic deformation. A previous plastic deformation intensifies diffusion considerably. There are 3 figures, 2 tables, and 10 references, 6 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut aviatsionnykh materialov  
(All-Union Scientific Research Institute of Aircraft Materials)

PRESENTED: April 19, 1958, by G. V. Kurdyunov, Academician

SUBMITTED: April 1, 1958

Card 3/3

ZHUKHOVITSKIY, A.A., otv.red.; VAGIN, Ye.V., red.; GOL'BERT, K.A., red.;  
DATSKEVICH, A.A., red.; TURKEL'TAUB, N.M., red.; FESENKO, Ye.P.,  
red.; YANOVSKIY, M.I., red.; VLASOV, L.G., red.izd-va;  
ASTAF'YEVA, A.G., tekhn.red.

[Gas chromatography; transactions of the First All-Union Conference  
on Gas Chromatography] Gazovaya khromatografiya; trudy Pervoi  
Vsesoyuznoi konferentsii po gazovoi khromatografii. Moskva,  
Izd-vo Akad.nauk SSSR, 1960. 326 p. (MIRA 14:3)

1. Vsesoyuznaya konferentsiya po gazovoy khromatografii. 1st.  
Moscow, 1959.

(Gas chromatography)

24.7760

1043, 1143, 1559

86701

S/180/60/000/006/019/030  
E111/E335

AUTHORS: Belashchenko, D.K., Bokshteyn, B.S. and  
Zhukhovitskiy, A.A. (Moscow)

TITLE: Electrodiffusion Potential in Metals

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye  
tekhnicheskikh nauk, Metallurgiya i toplivo,  
1960, No. 6, pp. 109 - 111

TEXT: The authors briefly discuss differences between movement of components in alloys and electrolytes under the influence of a direct current. In a report on work carried out at the Moskovskiy institut stali (Moscow Steel Institute), Belashchenko and Zhukhovitskiy previously formulated the existence of a diffusion potential in a binary alloy. The object of the present work is the experimental verification of the existence of a diffusion gradient of potential in metals. To obtain a reasonably large value of the gradient, it was decided to use liquid metals. The system Pb=Sn at 350 - 450 °C was chosen. To measure the potential difference, a specimen (a vertical capillary with the two liquid metals)

X

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86701

S/180/60/000/006/019/030  
E111/E335

# Electrodifffusion Potentials in Metals

was connected in series with other specimens and a galvanometer of 14.3 ohm internal resistance and  $30 \times 10^{-9}$  A/division maximum sensitivity. Convection was not a significant factor in the experiments. Fig. 2 shows the diffusional potential difference,  $\Delta\phi \cdot 10^{-6}$  V, as a function of time,  $\tau$  hrs (zero time corresponds to

attainment of desired temperature) at 375 °C. The initial value of  $5.0 \pm 1.5 \mu V$  (the lead being more positive) stays constant for some hours and then decreases to zero (the step on the isotherm shown is not significant); it agrees in order of magnitude with that theoretically expected. Values for the diffusion coefficient and activation energy found from results of these experiments agree with published values (Ref. 1). Care was taken to prevent interference by thermoelectric e.m.f., whether due to furnace conditions or differences in mutual heats of solution and absence of these was verified. The authors point out the suitability of the investigated effect for

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86701

S/180/60/000/006/019/030  
E111/E335

Electrodifffusion Potentials in Metals

determination of molecular characteristics, such as effective charge and mobility of metal ions. They recommend its investigation on systems where higher values are to be expected, e.g. semiconductors. There are 2 figures and 2 Soviet references.

X

SUBMITTED: August 26, 1960  
Card 3/3

BOKSHEYN, S.Z., doktor tekhn.nauk; GUDKOVA, T.I., kand.tekhn.nauk;  
ZHUKHOVITSKIY, A.A., doktor khim.nauk, KISHKIN, S.T., doktor  
tekhn.nauk

Effect of prestressing and of the creep process on diffusion  
inside and along the grain boundaries. Trudy MAI no.123:35-40  
'60. (MIRA 13:8)  
(Crystal lattices) (Creep of metals)

ZHUKHOVITSKIY, A.A.; TUNDEL'TAUB, N.M.

New variants in gas chromatography for the automatic control of  
petrochemical processes. Neftokhimiia 2 no.6:818-824, M-D '62.

(MIRA 17:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut yadernoy geofiziki  
i geokhimii.

ZHUKHOVITSKIY, A.A.; MALYASOVA, L.A.; TURKEL'TAUB, N.M.

Analysis of unresolved peaks with similar retention times; iterative chromatography. Neftokhimiya 2 no.6:831-836 M-D '62. (MIRA 17:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut yadernoy geofiziki i khimii.

ALEKSEYEVA, K.V.; ZHURKOVITSKIY, A.A.; TUMENL'TAUD, N.M.

Efficiency of preparative chromatographs. Neftokhimiya 2 no.6:  
934-939 N-D '62. (HRA 17:10)

1. Gosudarstvennyy proyektnyy i nauchno-issledovatel'skiy institut  
promyshlennosti sinteticheskogo kauchuka.

ACCESSION NR: AT4013931.

S/2659/63/010/000/0081/0086

AUTHOR: Blistanov, A. A.; Bokshteyn, S. Z.; Gudkova, T. I.; Zhukhovitskiy, A. A.  
Kishkin, S. T.

TITLE: Investigation of the influence of stress on pore formation

SOURCE: AN SSSR. Institut metallurgii. Issledovaniya po zharoprochny<sup>m</sup> splavam,  
v. 10, 1963, 81-86

TOPIC TAGS: pore formation, high temperature stress, external stress, strain,  
cracking, brass, alloy structure

ABSTRACT: Pores arise from the coagulation of vacancies produced in the crystal lattice by high temperatures and the effect of external stress and plastic deformation. There is very little information in the world literature on the various factors affecting pore formation, and most of the work which has been done is qualitative in nature. There has been little theoretical work with a quantitative approach, and no experimental work, despite the importance of the subject. The present investigation considered the main laws of pore distribution, the influence of external factors on pore formation, the relationship between pore formation and the structure of the specimen, and the mechanism

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ACCESSION NR: AT4013931

of the formation of pores and cracks in the presence or absence of external factors. Experiments were carried out on  $\alpha$ -brass annealed for 50 hrs. at 800C, electropolished, heated by diffusion and then subjected to density determination and examination of the microstructure. The results corroborated the main laws of pore distribution near the sample surface, but showed that the distribution often differed from that predicted on the basis of the laws of diffusion. A theoretical analysis is carried out of the nature of pore distribution at varying depths in the specimen, yielding a calculated curve with a maximum pore density which agreed well with the experimentally determined curve for brass. In polycrystalline brass, pore formation takes place primarily as the result of the limited diffusion of zinc, with volume diffusion playing an increasing role at high temperatures. External stress was found to play an important role in accelerating pore formation and development along the grain boundaries. Under the influence of stress, the energy of activation for pore formation was increased to 26 kcal/gram-atom. It was thus of the same order of magnitude as the energy of activation of diffusion of the volatile component along the grain boundaries. It is suggested that at high temperatures cracks develop mainly as the result of destruction of material remaining between the pores, while at low temperatures the principal process is pore coagulation. The role of impurities in pore formation and their effect in determining the pore distribution is pointed out. A theoretical evaluation of the role of the grain boundaries in pore formation, using the

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ACCESSION NR: AT4013931

Fisher formula, showed that the grain boundaries are the principal channels along which the movement of the volatile component takes place. Orig. art. has: 3 figures and 1 formula.

ASSOCIATION: Institut metallurgii AN SSSR (Metallurgical Institute, AN SSSR)

SUBMITTED: .00

DATE ACQ: 27Feb64

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

3/3

Card

ACCESSION NR: AT4040417

S/0000/64/000/000/0133/0146

AUTHOR: Blistanov, A. A.; Bokshteyn, S. Z.; Gudkova, T. I.; Kishkin, S. T.; Zhukhovitskiy, A. A.

TITLE: Pore formation and rupture at high temperatures in relation to stress and metal structure

SOURCE: Protsessy\* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-vo Mashinostroyeniye, 1964, 133-146

TOPIC TAGS: alpha brass, nichrome, nickel based alloy, alloy pore formation, volatile constituent diffusion, grain boundary effect, stress effect, metal structure effect, high temperature failure, metal failure analysis

ABSTRACT: This study concerned the kinetics of pore formation, as well as the effects of stress, temperature and structure of the metal on such processes in relation to failure of the metal at high temperatures. Sheet samples of alpha brass (32% Zn and 68% Cu; annealed 50 hrs. at 800C and 0.01 mm Hg) and a Nichrome alloy (20% Cr, 80% Ni; prehomogenized

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ACCESSION NR: AT4040417

50 hrs. at 1200C in argon) were polished electrolytically, then homogenized in a vacuum (residual pressure 0.001 mm Hg, temp. 500 - 1250C, volatile component distillation) under stresses varying from 15 to 120 kg/cm<sup>2</sup> or unstressed. Results obtained with the brass samples indicate that pore formation is initiated due to evaporation and the accompanying diffusive migration of constituents. The effect of grain boundaries is not apparent in the initial stages, but becomes clearly pronounced as the process continues. Pores form earlier as temperature rises. The presence of stress accelerates the process and the effect of grain boundaries rises sharply. The process is completed by cracking and rupture along the grain boundaries. Pore formation was absent in unstressed nichrome, while stressed samples showed significant porosity, cracks and eventual failure, mainly along the grain boundaries. Other experiments indicate that heterogeneity of the material significantly affects patterns of pore distribution. It is concluded that similar studies will permit physical analysis of metal failure at high temperatures. Orig. art. has: 4 graphs and 8 photomicrographs.

ASSOCIATION: none

SUBMITTED: 09Dec63

SUB CODE: MM

Card 2/2

DATE ACQ: 28May64

NO REF SOV: 003

ENCL: 00

OTHER: 003

ACCESSION NR: AT4040418

S/0000/64/000/000/0147/0151

AUTHOR: Bokshteyn, S. Z.; Gudkova, T. I.; Zhukhovitskiy, A. A.; Kishkin, S. T.

TITLE: Effect of preliminary deformation on pore formation

SOURCE: Protsessy\* diffuzii, struktura i svoystva metallov (Diffusion processes, structure and properties of metals); sbornik statey. Moscow, Izd-va Mashinostroyeniye, 1964, 147-151

TOPIC TAGS: alpha brass, pore formation, preliminary deformation effect, high temperature effect, metal evaporation, alloy failure

ABSTRACT: Cylindrical samples ( $h = 10$  mm) of alpha brass (38% Zn, 62% Cu) were annealed for 3 hrs. at 800C in an argon atmosphere, then pressed at room temperature to deformation levels of 3-5%, 15-20% and 55-60%. The effect of preliminary deformation on evaporation was evaluated from changes in sample weight during subsequent vacuum homogenizing (4 hrs. at 700, 800 or 850C). It was found that preliminary plastic deformation increased the rate of evaporation, as well as the number and size of pores forming at high temperatures. The effect was most pronounced at deformation levels of 10% or less and

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